

Newsletter of the
Materials Physics
and Applications
Division

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Photo by Paul Canfield, Ames Laboratory

For his kanreki (Japanese 60th birthday ceremony) Joe Thompson wears the outfit presented to him by Professor Hiroshi Yasuo-oka from the Japanese Atomic Energy Agency. Japanese custom holds that life starts over at age 60; the red hood and vest, traditionally worn by infants, thus symbolize Thompson's rebirth.

ICAM workshop honors condensed matter physicist Joe D. Thompson

The Institute for Complex Adaptive Matter (ICAM) recently hosted "The Heavy Fermion Frontier: a Workshop in Honor of Joe D. Thompson's 60th Birthday" in Santa Fe.

The workshop, organized by MPA-10's Zachary Fisk and MPA-DO's John Sarrao, brought together heavy-fermion researchers from around the world to discuss the field's current state and its future direction.

A retrospective slide show was presented at the banquet highlighting Thompson's accomplishments during the past 20 years and included numerous photos of Thompson's former postdoctoral researchers, many who are now grey-haired Los Alamos managers.

Thompson is a fellow of the American Physical Society, the American Association for the Advancement of Science, and Los Alamos National Laboratory. He is also a senior fellow of the Japan Physical Society.

His research in condensed-matter physics has spanned problems posed by a spectrum of materials and is motivated primarily by interest in discovering and understanding exotic states produced by strong electronic correlations and the response of these states to high pressures.

MPA-STC top-rated in DOE's superconductivity for electric systems peer review

In August, the Department of Energy's Office of Electricity Delivery and Energy Reliability held the Superconductivity for Electric Systems Peer Review outside Washington, DC.

Los Alamos National Laboratory was recently notified that its presentation, "Progress in Understanding Thickness Dependence and Vortex Pinning for Enhanced Coated Conductor Performance" by MPA-STC staff Leonardo Civale, Boris Maiorov, and Steve Foltyn, was top-rated among 10 talks from various national laboratories and universities in the strategic research session.

Other review contributions by MPA-STC's Quanxi Jia, Terry Holesinger, and Steve Ashworth were also

highly rated by the respective review panels. MPA-STC Deputy Center Leader Ken Marken highlighted Los Alamos results and MPA-STC Center Leader Dean Peterson presented a final review overview.

More than 200 attendees participated in the program review, which included separate panel evaluations of technical results in three areas.

"High temperature superconducting (HTS) applications" included projects such as HTS cables, fault current limiters, transformers and motors; "strategic research" focused on basic materials development for HTS wires; and "second generation wire" focused on the development of long-length, high performance HTS wire.

From Alex's desk

MPA: Congratulations on a successful 2007 and happy holidays

Having addressed the Division just last month in this space on the challenges facing the Institution, I debated on what to focus on as the year comes to a close.

As the holidays are a time to reflect on the things for which we are thankful, I thought perhaps of mentioning the impressive and remarkable accomplishments of our Division. A brief perusal of the year's *MPA Material Matters* outlined the significant and varied achievements and I soon realized this was a monumental task as MPA has done so well on so many fronts.

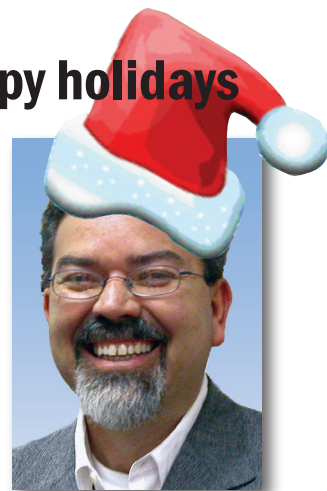
MPA staff members continue to be internationally recognized for their scientific and technical achievements with prestigious fellowships, awards, and memberships on scientific panels. Our expertise in materials physics and applications continues to garner press in esteemed research publications and our technology is sought after

in vital collaborations and praised in distinguished competitions. We remain a voice in the international scientific community with invited talks at influential conferences, symposia, and workshops.

How about if I just take this opportunity to wish all of you a safe and fun holiday break. Please take some time off and relax; at least this is what I'm planning to do. Have a great break and come back reenergized. You are the major players that make our Division so successful.

2008 will be great!

—Interim MPA Division Leader
Alex H. Lacerda



I read it in *MPA Material Matters*

MPA Material Matters features technical highlights developed each week for the Director's Office. If you have news you'd like to see featured, please send details to your group leader to be forwarded to *MPA Material Matters* Editor Karen Kippen.



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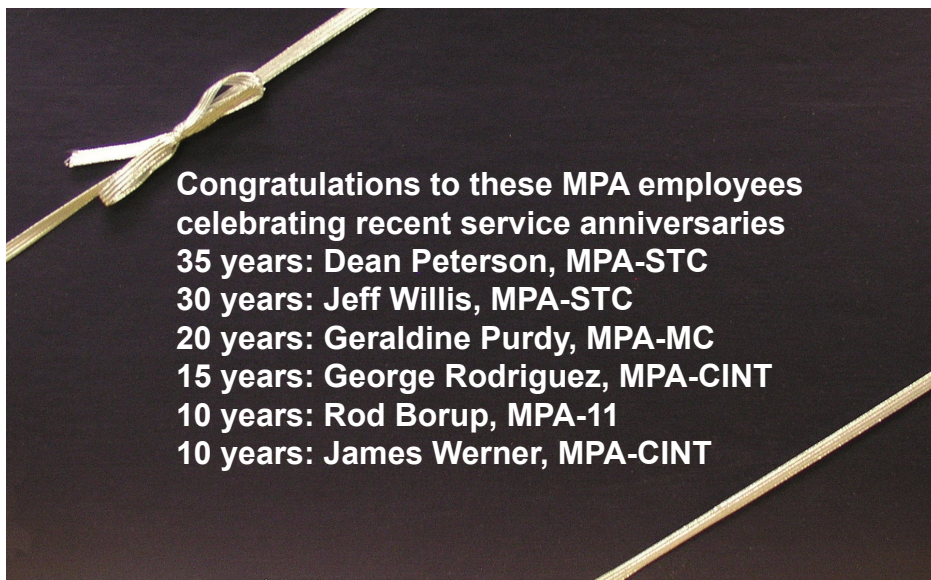
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To read past issues of *MPA Material Matters* see www.lanl.gov/orgs/mpa/materialmatters.shtml



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Celebrating service



Congratulations to these MPA employees celebrating recent service anniversaries
 35 years: Dean Peterson, MPA-STC
 30 years: Jeff Willis, MPA-STC
 20 years: Geraldine Purdy, MPA-MC
 15 years: George Rodriguez, MPA-CINT
 10 years: Rod Borup, MPA-11
 10 years: James Werner, MPA-CINT

MPA-11 PEM fuel cell experts co-author review article in 100th thematic issue of *Chemical Reviews*

MPA-11 PEM fuel cell experts contributed a review article on the “Scientific Aspects of Polymer Electrolyte Fuel Cell Durability and Degradation” to the 100th thematic issue of *Chemical Reviews*. The article was written by lead author Rod Borup of MPA-11 and 27 co-authors (nine from Los Alamos) from 16 research institutions and universities in the United States and Japan, citing 645 references.

The issue’s theme was hydrogen and the article appears in

Chem. Rev., **107** 2007. This article was written in collaboration with researchers who attended a joint Los Alamos National Laboratory/Japan workshop in Santa Fe in August 2006, as part of collaboration under a memorandum of understanding between Los Alamos, the Japanese New Energy and Industrial Technology Development Organization (NEDO), and Japan’s Polymer Electrolyte Fuel Cell Cutting-Edge Research Center (FC-Cubic).

100-Tesla Team honored at PADSTE ceremony



Photos by Chuck Mielke, MPA-NHMFL

The 100-Tesla Team was honored at a recent ceremony recognizing Distinguished Performance Award large teams in the Principal Associate Directorate for Science, Technology, and Engineering. At left, Terry Wallace, principal associate director for Science, Technology, and Engineering, presents an award plaque to Dwight Rickel. At right, team members were presented with certificates. To read more about the award see the October *MPA Material Matters*.

New MPA-10 research sheds light on underlying mechanisms of superconductivity

By hole-doping with cadmium, lead author and MPA-10 postdoctoral researcher Ricardo Urbano and coworkers can tune the ground state in heavy fermion superconductor CeCoIn₅ between superconductivity and antiferromagnetism. Urbano’s nuclear magnetic resonance data indicate that these two orders coexist microscopically, with the magnetism emerging locally in the vicinity of the Cd dopants in the form of antiferromagnetic droplets.

The data suggest that the magnetism emerges locally in the vicinity of the Cd dopants in the form of antiferromagnetic droplets. This system offers a new way to investigate the dy-

namics of a quantum critical system and can shed light on the underlying mechanism of superconductivity.

The work, “Interacting Antiferromagnetic Droplets in Quantum Critical CeCoIn₅,” by Urbano, Nicholas Curro, and Joe Thomspson, MPA-10; B.-L. Young, National Chiao Tung University, Taiwan; LD. Pham, University of California, Davis; and Z. Fisk, University of California, Irvine, appears in *Physical Review Letters* **99**, 146402 (2007).

Work at Los Alamos National Laboratory was funded by the Los Alamos National Laboratory Directed Research and Development program.

Heads UP, MPA!



Prepare for the holiday closure

The Laboratory's annual winter closure begins at the end of the work day on December 21. While facility operations teams will inspect major facilities and address problems during the closure, all employees should take precautionary steps to help secure their workspace before leaving for the break.

To see guidelines before departing for the holiday, see the most recent Los Alamos Newsletter, <http://www.lanl.gov/news/newsletter/120307.pdf>

Improperly secured classified slides

Work environment, human nature, task demands, and individual capabilities are the four general categories of precursors to human error. A new "Anatomy of an Incident" illustrates how stress (human nature) and time pressure (task demands) contributed to an error that fortunately did not result in a serious security incident.

See http://int.lanl.gov/security/documents/anatomy/slides10_07.pdf.

Take another look at how you recycle

Recycling has come a long way since its inception. Now, there are programs across the country to recycle paper, plastic, aluminum, cell phones and even computers, as well as a wealth of consumer goods made out of recycled content. All of which prompts the question, are you recycling the old way, or the new way?



Read this month's ENVIRO-gram at

Heads UP, MPA! reports on environment, safety, and health, security, and facility-related news and information.

http://int.lanl.gov/environment/waste/lanl_only/recycle/docs/071107_envirogram.pdf.

Does your work site need a first aid kit?

To assess whether a first aid kit would be useful in your work area, what one contains, and what to do once it's in place, see http://int.lanl.gov/health/occmcd/docs/first_aid.pdf.

Cyber security wireless computing devices procedure published

P213 provides the framework to manage and use wireless-enabled devices on Laboratory property. It identifies the types of wireless activities permitted and establishes requirements and responsibilities for the use of wireless devices. For more information see <http://policy.lanl.gov/pods/policies.nsf/MainFrameset?ReadForm&DocNum=P213&FileName=P213.pdf>.

Changes to Los Alamos Research Park access and parking

New access and parking rules are now in effect at the Los Alamos Research Park on West Jemez Road.

The research park driveway off Diamond Drive is now open and the security barricades have been moved to an area just east of the Americans with Disabilities Act (ADA) parking area behind the Los Alamos Fire Department Fire Station 1 building.

For more information, see http://int.lanl.gov/news/index.php/fuseaction/nb.story/story_id/12039/nb_date/2007-11-29.

CINT user workshop set for January

The Center for Integrated Nanotechnologies will hold its sixth User Workshop January 9-10 in Albuquerque.



The CINT User Workshop is an opportunity for the nanoscience community to become involved in CINT as well as to shape its future. Attendees will learn about the capabilities at the CINT Core Facility in Albuquerque and Gateway Facility in Los Alamos, as well as the latest research results from CINT scientists and users. A highlight of the workshop will be the symposia on nanowires and membrane-based nanocomposites, two focused areas of particular interest to CINT and its user community.

Guest speakers include Altaf Carim of the DOE Office of Basic Energy Science, Barbara Baird of Cornell University; and Evelyn Hu of the University of California at Santa Barbara.

To register for the workshop, see <http://cint.lanl.gov/workshop2008/index.shtml>. Registration deadline is January 1. Cost is \$175 per person, postdoctoral researchers and students \$75.

When the weather outside is frightful....

Laboratory personnel can call the update telephone hotline at 667-6622 or 1-877-723-4101 for information regarding the Laboratory's operating status. The message on the hotline will change only if conditions warrant a change in closure or delayed opening status. Area television and radio stations also are notified about the Laboratory's operating status. Employees are reminded that the intent of delayed starts or closures is to prepare the site for safe arrival and should be as complete as possible before opening, therefore, employees should not attempt to arrive at worksites before the official opening.

